Louisiana Department of Environmental Quality (LDEQ)
Office of Environmental Services

STATEMENT OF BASIS

Occidental Chemical Corp
Chlorine Caustic Facility
Hahnville, St. Charles Parish, Louisiana
Agency Interest Number: 1137
Activity Number: PER20090006
Proposed Permit Number: 2520-00007-V5

I. APPLICANT

Company:
Occidental Chemical Corp
266 Hwy 3142
Hahnville, Louisiana 70057

Facility:
Chlorine Caustic Facility
266 Hwy 3142
Hahnville, St. Charles Parish, Louisiana
Approximate geographic coordinates: 29° 59' 14" North, 90° 27' 17" West.

II. FACILITY AND CURRENT PERMIT STATUS

Occidental's Taft facility (also known as its Chlorine Caustic Facility) is comprised of the following processes or activities:

1. Chlor-Alkali I (C/A I)
2. Chlor-Alkali II (C/A II)
3. Diaphragm Preparation
4. Groundwater Remediation System
5. Co-Generation Operations (separately permitted)

The two chlor-alkali plants utilize electricity and brine (a mixture of sodium chloride and water) to produce chlorine and caustic soda. In addition, hydrogen is generated as a byproduct of this process. The brine is solution mined from salt dome formations located in Napoleonville, LA and transferred via pipeline to a raw brine storage pond and an associated brine tank located on-site, where it is retained until it is treated for processing in the two chlor-alkali plants. Electricity and steam are supplied to the chlor-alkali plants by the Occidental Chemical Taft Co-Generation facility.

Occidental Chemical Corp
Chlorine Caustic Facility
Hahnville, St. Charles Parish, Louisiana
Agency Interest Number: 1137

Chlor-Alkali Plants I and II

Chlorine (Cl_2), caustic soda (NaOH), and hydrogen (H_2) are produced by brine electrolysis. Both Chlor-Alkali plants utilize asbestos diaphragm cells to achieve brine electrolysis. The electrolytic reaction is summarized by the following stoichiometric equation:

$$2NaCl + 2H_2O + electricity \rightarrow Cl_2 + 2NaOH + H_2$$

Typically, all gaseous components from the electrolytic cells (Cl_2, H_2 and water vapor) are contained and directed elsewhere for further processing, however each plant has an emergency vent system with a caustic scrubber to eliminate Cl_2 emissions. All repair, preparation and regeneration of the asbestos diaphragms for C/A I and C/A II occur within C/A II.

The chlor-alkali processes employed in C/A I and C/A II, involve the following steps:

1. Brine treatment
2. Brine heating/ Hydrogen cooling and compression
3. Brine resaturation
4. Brine pH control
5. Electrolysis in diaphragm cells
6. Caustic evaporation
7. Chlorine compression and Off-gas treatment
8. Diaphragm preparation

Groundwater Remediation

The groundwater remediation system consists of a decanter, a stripper feed tank vent condenser, primary and secondary condensers, storage tanks, and a steam stripper. Collected groundwater flows to a 2,080 gallon capacity decanter. Non-aqueous phase liquid (NAPL) organics are sent to a 13,200 gallon horizontal storage vessel. The aqueous phase liquid (APL) stream passes through a 13,200 gallon horizontal feed tank prior to being pumped to a steam stripper. The tanks are vented to a vent condenser to remove organics from the vapors.

The APL is pumped into the top of the steam stripper. The organics are stripped out of the liquid and into the vapor phase. The primary and secondary condensers remove most of the vapors and recover the liquid organics.

Noncondensable vapors from the primary and secondary condensers and overheads from the tank vent condenser are passed through a carbon filter prior to venting to the atmosphere.

Note: The sulfur monochloride unit is no longer operational.

Occidental Chemical Corp
Chlorine Caustic Facility
Hahnville, St. Charles Parish, Louisiana
Agency Interest Number: 1137

Potassium Hydroxide Modification

The C/A I membrane cell circuit that was previously in sodium caustic service was converted to potassium chloride service. The KCl salt is delivered by railcar and unloaded to a hopper which is housed in a lined concrete basement.

Chlorine (Cl_2), potassium hydroxide (KOH), and hydrogen (H_2) are produced by brine electrolysis. The reaction of KCl brine is summarized by the following stoichiometric equation:

$$2KCl + 2H_2O + electricity \rightarrow Cl_2 + 2KOH + H_2$$

Typically, all gaseous components from the electrolytic cells (Cl_2, H_2 and water vapor) are contained and directed elsewhere for further processing, however each plant has an emergency vent system with a caustic scrubber to eliminate Cl_2 emissions. The following steps are employed in potassium hydroxide synthesis.

1. KCl Unloading and Dissolving
2. Primary/ Secondary KCl Brine Process
3. Brine pH control and treatment
4. Brine De-Chlorination
5. Brine Heating/ Hydrogen cooling and compression
6. Caustic evaporation
7. Water De-ionization

Occidental Chemical Corp - Chlorine Caustic Facility is a designated Part 70 source. The Occidental Chemical Corp - Chlorine Caustic Facility currently operates under Permit No. 2520-00007-V4, issued October 1, 2008, and administratively amended December 2, 2008, and General Permit No. 3074-V0, issued May 18, 2009.

One Part 70 permit has been issued to an operating unit within the complex. It is:

Permit No.	Unit or Source	Date Issued
2598-V1	Taft Cogeneration Facility	3-16-2006

In addition, PSD Permit PSD-LA-633(M-1), issued March 16, 2006, and Acid Rain Permit 2598-IV1, issued August 18, 2006, were also issued to the Taft Cogeneration Facility.

Occidental Chemical Corp
Chlorine Caustic Facility
Hahnville, St. Charles Parish, Louisiana
Agency Interest Number: 1137

III. PROPOSED PROJECT/PERMIT INFORMATION

Application

A permit application and Emission Inventory Questionnaire were submitted by Occidental Chemical Corp on March 19, 2009, requesting a Part 70 operating permit. Additional information dated August 26, 2009, was also received.

Project

With the renewal and minor modification, Occidental Chemical Corporation proposes to:

- Renew its Part 70 Permit for the Chlorine Caustic Facility;
- Change the calculation method for the Asbestos Dust Collection Vent (RLP 10) to reflect the replacement of the baghouse with a primary filter and a HEPA filter;
- Update various emissions estimates based on updated emission factors and/or more accurate emissions calculation methods;
- Delete the Diaphragm Drying Oven (EQT 34), Membrane Hydrogen Cooler (EQT 38), and the Membrane Water Deionizer HCl Storage Tank Vent (EQT 39) from the permit;
- Change the throughput in the Gasoline Tank (EQT 23);
- Incorporate Permanent Diesel Fired Equipment (EQT 51) into the permit. This source was previously permitted under Title V General Permit No. 3074-V0. Rental – Hurricane Diesel Fired Equipment and Rental – Maintenance Diesel Fired Equipment were also included in Permit No. 3074-V0, but will no longer be permitted;
- Incorporate the Membrane Precoat System (EQT 53) into the permit. This source has been in existence since the facility has been in operation, but was not previously permitted; and
- Incorporate Permanent Gasoline-Fired Equipment (EQT 54) into the permit.

Proposed Permit

Permit 2520-00007-V5 will be the Part 70 operating permit renewal and modification for the Chlorine Caustic Facility.

Insignificant Activities

All Insignificant Activities are authorized under LAC 33:III.501.B.5. For a list of approved Insignificant Activities, refer to the Section IX – Insignificant Activities of the proposed permit.

V. PERMIT SHIELD

There is no permit shield.

VI. PERIODIC MONITORING

Compliance Assurance Monitoring (CAM) – 40 CFR 64

Compliance Assurance Monitoring (CAM) in accordance with 40 CFR 64 is not applicable to this facility. Pre-control emissions of all sources are less than the major source threshold.

Periodic Performance Testing Requirements

The following sources are required by LDEQ to conduct performance tests for nitrogen oxides and carbon monoxide within 180 days after initial startup (or restart-up after modification) and after each major engine overhaul: Permanent Diesel Fired Equipment (EQT 51). The testing must be done for each engine that is greater than 500 horsepower and operates more than 720 hours in a semiannual period. Further, oxygen and carbon monoxide for these sources must be monitored using a portable analyzer, if the source in question operates more than 720 hours in any six month period.

Scrubber Monitoring

Once per shift, the facility shall visually monitor the presence or absence of a continuous flow of water to the scrubber for the following sources: C/A II HCl Storage Tanks Scrubber Vent (EQT 15), C/A I Membrane HCl Storage Tanks Scrubber Vent (EQT 29), C/A I Membrane Regen HCl Storage Tank Scrubber Vent (EQT 35), C/A I Water Deionizer HCL Storage Tank Vent (EQT 36), Membrane Water Deionizer HCL Storage Tank Vent (EQT 39), C/A I Diaphragm HCL Storage Tanks Scrubber Vent (EQT 26), and Cathode/Anode Dip Tanks Scrubber System (EQT 33). The facility must record the results of the monitoring upon each occurrence and make the records available for inspection by DEQ personnel.

VII. GLOSSARY

Carbon Monoxide (CO) – A colorless, odorless gas, which is an oxide of carbon.

Maximum Achievable Control Technology (MACT) – The maximum degree of reduction in emissions of each air pollutant subject to LAC 33:III.Chapter 51 (including a prohibition on such emissions, where achievable) that the administrative authority, upon review of submitted MACT compliance plans and other relevant information and taking into consideration the cost of achieving such emission reduction, as well as any non-air-quality health and environmental impacts and

energy requirements, determines is achievable through application of measures, processes, methods, systems, or techniques.

Hydrogen Sulfide (H_2S) – A colorless inflammable gas having the characteristic odor of rotten eggs, and found in many mineral springs. It is produced by the reaction of acids on metallic sulfides, and is an important chemical reagent.

New Source Review (NSR) – A preconstruction review and permitting program applicable to new or modified major stationary sources of air pollutants regulated under the Clean Air Act (CAA). NSR is required by Parts C ("Prevention of Significant Deterioration of Air Quality") and D ("Nonattainment New Source Review").

Nitrogen Oxides (NO_X) – Compounds whose molecules consist of nitrogen and oxygen.

Organic Compound – Any compound of carbon and another element. Examples: Methane (CH_4), Ethane (C_2H_6), Carbon Disulfide (CS_2)

Part 70 Operating Permit – Also referred to as a Title V permit, required for major sources as defined in 40 CFR 70 and LAC 33:III.507. Major sources include, but are not limited to, sources which have the potential to emit: ≥ 10 tons per year of any toxic air pollutant; ≥ 25 tons of total toxic air pollutants; and ≥ 100 tons per year of regulated pollutants (unless regulated solely under 112(r) of the Clean Air Act) (25 tons per year for sources in non-attainment parishes).

PM_{10} – Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers as measured by the method in Title 40, Code of Federal Regulations, Part 50, Appendix J.

Potential to Emit (PTE) – The maximum capacity of a stationary source to emit any air pollutant under its physical and operational design.

Prevention of Significant Deterioration (PSD) – A New Source Review permitting program for major sources in geographic areas that meet the National Ambient Air Quality Standards (NAAQS) at 40 CFR Part 50. PSD requirements are designed to ensure that the air quality in attainment areas will not degrade.